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| 10/742,121 | 12/19/2003 | Mark S. Pavlin | ARZ-024635-US | 5037 |
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| Richard C. Stewart II 6285 Tri Ridge Blvd. Loveland, OH 45140-7910 | | | MARTIN, LAURA E | |
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DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/742,121

Applicant(s)

PAVLIN, MARK S.

Examiner

Laura E. Martin

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2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20,22-35 and 37-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20,22-35 and 37-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- 4, 6, 8, 9-11, 12-14, 16, 18, 20, 22, 23, 26, 27, 28, 30, 33, 35, 37, 38, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz et al (US 5006170) in view of Frihart et al. (US 5194638).

As per claim 1, Schwarz et al. teaches a method of printing comprising charging a printhead (column 2, line 9-10) of an inkjet printer with ink (column 2, line 14-15), the ink being a fluid homogenous mixture (column 14, line 32-34) comprising polymerized fatty acid based polyamide resin (column 6, line 53), organic solvent (propellant), and colorant (column 4, line 18), wherein the organic solvent comprises a first solvent and a second solvent ("examples of suitable propellants for the hot melt inks of the present invention include" column 13, L63-column 14, line 27 does not limit solvent to one of the following propellants), where the first solvent comprises at least one solvent selected from the solvent consisting a single amide, a single carbamide, or a single hydroxyl group (urea column 13, line 67) as the only non-hydrocarbon moiety in the solvent; and the second solvent comprises at least one hydrocarbon solvent (column 14, lines 4-5); and transferring the ink from the printhead onto the substrate (column 2, lines 15).

As per claim 2, Schwarz et al. teaches the printer being a drop-on-demand printer (hot ink melt column 3, lines 62-63 is a type of drop-on-demand printer column 1, lines 43-44).

As per claim 4, 12, 14, and 16 Schwarz et al. teaches the first solvent comprising at least one of N-methylpyrrolidinone, N,N-dimethylformamide, N,N-dimethylacetamide, and tetramethylurea (suitable propellants include ureas column 13, lines 67), and the second solvent comprises at least one terpene hydrocarbon (suitable propellants include hydrocarbons column 14, lines 4-5).

As per claim 6 and 18, Schwarz et al. teaches the organic solvent further comprising a third solvent ("examples of suitable propellants for the hot melt inks of the present invention include" column 13, line 63-column 14, line 27 does not limit solvent to one of the following propellants), selected from α -hydroxy-carboxylic ester, polyalkylene glycol alkyl ether, and ketone-containing solvents (suitable propellants include ketones column 14, line 4).

As per claim 9, Schwarz et al. teaches a printing ink composition comprising colorant, resin, and solvent (column 4, line 18), where the resin is a polymerized fatty acid-based polyamide resin (column 6, line 53), the solvent comprises a first solvent and a second solvent ("examples of suitable propellants for the hot melt inks of the present invention include" column 13, line 63- column 14, line 27 does not limit solvent to one of the following propellants) wherein the first solvent comprises at least one solvent having a single amide group or a single carbamide group (urea column 13, line

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67) as the only non-hydrocarbon moiety in the solvent; and the second solvent comprises at least one hydrocarbon solvent (column 14, column 4-5).

As per claim 11 and 28, Schwarz et al. teaches the components of the first solvent each having a total of 5 to 11 atoms selected from carbon, nitrogen, and oxygen (dimethyl urea and butanol column 13, line 67 have 5 carbon and oxygen atoms combined).

As per claim 22 and 37, Schwarz et al. teaches the resin comprising 5-40 wt% of the total weight of the resin or solvent (column 4, line 21 the binder is present in an effective amount, from 0-85%).

As per claim 23 and 38, Schwarz et al. teaches the solvent comprising at least 30 wt% of the total weight of resin and solvent (the propellant is present in an effective amount from 10 to about 90%).

As per claim 26, Schwarz et al. teaches a printing ink composition comprising colorant, resin, and solvent (column 4, line 18), where the resin is a polymerized fatty acid-based polyamide resin (column 6, line 52), the solvent comprises a first solvent and a second solvent ("examples of suitable propellants for the hot melt inks of the present invention include" column 13, line 63- column 14, line 27 does not limit solvent to one of the following propellants), wherein the first solvent comprises at least one solvent having a single hydroxyl group as the only non-hydrocarbon moiety in the solvent (butanol column 13, line 65); and the second solvent comprises at least one hydrocarbon (column 14, line 4-5).

Schwartz et al does not teach a polyamide resin that is the reaction product of reactants comprising polymerized fatty acid polyamide, ethylene diamine, hexamethylenediamine, and fatty acid.

Frihart et al. teaches a polyamide resin that is the reaction product of reactants comprising polymerized fatty acid polyamide, ethylene diamine, hexamethylenediamine, and fatty acid (column 8, line 65-column 9, line 18).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of printing and ink composition of Schwartz et al. with the polyamide resin of Frihart et al. in order to create a higher quality ink product.

As per claims 3, 8, 10, 20, 27, and 35 Schwarz et al. and Frihart et al. teach the claimed invention except for the ranges of propellants within the organic solvent (first solvent is at least 20% by weight, the second solvent is up to 80% by weight, and the third solvent is up to 50% by weight of the organic solvent in the ink). It would have been obvious to one having ordinary skill in the art at the time the invention was made to experiment using ranges of solvents so as to find the optimum combination, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As per claims 13 and 30, Schwarz et al. and Frihart et al. disclose the claimed invention except for the value of the viscosity of the solvent or parts thereof. It would

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have been obvious to one having ordinary skill in the art at the time the invention was made to measure all parameters, including the viscosity, of every chemical added into a solution during experimentation, Since it has been held that discovering an optimum value as a result effective variable only involves routine skill in the art *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As per claim 42, Schwarz et al. and Frihart et al. teach the claimed invention except for the ranges molecular weight for the polymerized fatty acid-based polyamide resin. It would have been obvious to one having ordinary skill in the art at the time the invention was made to experiment using ranges of solvents so as to find the optimum combination, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz et al. (US 5006170) and Frihart et al. (US 5194638), and further in view of Yamada et al. (US 5302631).

Schwarz et al. and Frihart et al. teach the printing ink of claim 14; however, neither teaches a second solvent comprising at least one terpene selected from the group consisting of α -pinene, β -pinene, limonene, and terpinolene.

Yamaba et al. teaches a solvent comprising α -pinene (column 2, lines 38-50).

It would have been obvious at the time of the invention to combine the ink composition of Schwarz et al. as modified with the solvent of Yamaba et al. because α -pinene increases the spreadability of the ink.

Claims 5, 7, 19, 29, 31, 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz et al. (US 5006170) and Frihart et al. (US 5194638), and further in view of Shawcross et al. (US 6767394).

As per claims 7, 19, and 34 Schwarz et al. and Frihart et al. teach the ink of claim 18 with a third solvent; however, neither teaches the third solvent selected from methyl lactate, ethyl lactate, n-propyl lactate, isopropyl lactate, diethylene glycol methyl ether, dipropylene glycol ether, or cyclohexane.

Shawcross et al. teaches a solvent comprising cyclohexane (column 5, line 31).

It would have been obvious at the time of the invention to combine the teachings of Schwarz et al. with the solvent of Shawcross et al. because it mixes well with water.

As per claim 5, 29, 31, and 32 Schwarz et al. and Frihart et al. (US 5194638) teach an ink composition with organic solvents.

However, neither reference teaches the first solvent to comprise a hydroxyl containing solvent selected from cyclohexanol, 1-hexanol, 2-hexanol, 3-hexanol, cis-2-hexen-1-ol, cycloheptanol, 1-heptanol, 2-heptanol, 2-ethyl-1-hexanol, 1-octanol, 1-nonanol, 3,5,5-trimethyl-hexanol, 1-decanol, α -terpineol, and 3,7-dimethyl-3-octanol (tetrahydrolinalool) and the second solvent is not taught to comprise a mineral spirit.

Shawcross et al. teaches a solvent comprising octanol (column 6, lines 5-6) and hexanol (column 6, lines 6), as well as a mineral spirit (turpentine column 6, lines 11).

It would have been obvious at the time of the invention to combine the ink of Schwarz et al. with the solvent of Shawcross et al. because Schwarz et al. does not list all of the specific hydroxyl containing solvents that can be utilized in the taught design.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz et al. (US 5006170) and Frihart et al. (US 5194638), and further in view of Visser et al. (US 6148165) and Lin et al. (US 6328393).

Schwarz et al. and Frihart et al. teach a printing ink while an amide containing solvent (urea column 13, line 67) and a hydrocarbon solvent (column 14, lines 4-5); however, neither teaches the specific chemicals N-methylpyrrolidinone and terpinolene.

Visser et al. teaches that N-methylpyrrolidinone is a known amide (column 6, L49-51).

It would have been obvious at the time of the invention to combine the ink composition of Schwarz et al. as modified with the N-methylpyrrolidinone taught by Visser et al. because it is a known amide.

Lin et al. teaches that terpinolene is a known hydrocarbon (column 7, lines 22-25).

It would have been obvious at the time of the invention to combine the ink composition of Schwartz et al. as modified with the terpinolene taught by Lin et al. because it is a known hydrocarbon.

Claims 21 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz et al. (US 5006170) and Frihart et al. (US 5194638), and further in view of Bedford et al. (US 2004/0226476).

Schwarz et al. teaches an ink composition with a polyamide (column 6, line 53).

Neither reference teaches polyamide being a reaction product of polymerized fatty acid, ethylene diamine, hexamethylenediamine, and fatty acid.

Bedford et al. teaches a dimmer based tetra-amide (polyamide) that is the reaction product of dimer acid (polymerized fatty acid), ethylene diamine, stearic acid (fatty acid) [0018].

It would have been obvious to combine the ink composition taught by Schwarz et al. as modified with that of Bedford et al. because the formula taught by Bedford is a suitable material for phase changing ink.

Claims 24, 25, 39, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz et al. (US 5006170) and Frihart et al. (US 5194638), and further in view of Adkins et al. (US 6113679).

As per claims 24, 25, 39, and 40 Schwarz et al. teaches ink; however, he does not disclose the viscosity at temperatures between 25°C and 60°C

Adkins discloses a viscosity between of 10-20 cps at 25° C for ink (column 2, lines 51-54) and a flashpoint of greater than 40°C (column 7, lines 58-61).

It would have been obvious at the time of the invention to combine the teachings of Schwartz et al. as modified with the measurements of Adkins because it is necessary to measure the properties of ink during experimentation so as to find the best possible operating conditions.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz et al. (US 5006170) and Frihart et al. (US 5194638), and further in view of Smith (US 5109054).

Schwarz et al. and Frihart et al. teach a printing ink; however, neither teaches the polymerized fatty-acid based polyamide resin having a softening point of at least 70°C.

Smith teaches the polymerized fatty-acid based polyamide resin having a softening point of at least 70°C (column 10, lines 55-58).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the printing ink of Schwarz et al. as modified with the disclosure of Smith in order to create a higher quality printed image.

Response to Arguments

Applicant's arguments with respect to claims 1-20, 22-35, and 37-42 have been considered but are moot in view of the new ground(s) of rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura E. Martin whose telephone number is (571) 272-2160. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Laura E. Martin

 5/1/06
MANISH S. SHAH
PRIMARY EXAMINER